

What is claimed is:

1. A system for applying pigment to a substrate, comprising:

a spectrophotometer integral to the system supplying light to the substrate and receiving light from the substrate, wherein the light received from the substrate is spectrally analyzed by a spectrometer;

5 one or more pigment dischargers integral to the system, wherein the one or more pigment dischargers apply one or more pigments to the substrate;

wherein, the spectrometer spectrally analyzes the or more pigments applied to the substrate.

10 2. The system of claim 1, wherein the spectrometer comprises:

an optical sensing circuit having thereon a plurality of optical sensors and one or more processing elements;

a plurality of filters fixedly positioned over at least a first group of the optical sensors fixedly and fixedly positioned with respect to the substrate, wherein the plurality of filters have spectral transmission characteristics over a predetermined spectrum;

15 an optical manifold fixedly positioned over at least certain of the plurality of filters and fixedly positioned with respect to the substrate, wherein the optical manifold has a plurality of exit windows and at least one entrance port, wherein light entering the entrance port is transmitted to an interior portion of the optical manifold, wherein at least a portion of the light is transmitted from the exit ports through at least certain of the filters for sensors by at least certain 20 of the optical sensors;

wherein light may be coupled to the entrance port, wherein at least first spectral data corresponding to the light is generated by the one or more processing elements, wherein the spectrometer assembly is fabricate in a unitary manner on the substrate.